

# Bay Area Scientists in Schools Presentation Plan

Lesson Name \_\_\_\_\_ (Bio) Diversity in Insects: Examining the World \_\_\_\_\_

Presenter(s) \_\_\_\_\_ Gordon M. Bennett \_\_\_\_\_

Grade Level \_\_\_\_\_ 2<sup>nd</sup> \_\_\_\_\_

## Standards Connection(s)

- 2.a Students know that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another.
- 2.c Students know many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.
- 2.d Students know there is variation of one kind within a population.

**Abstract:** *Your opportunity to tell teachers and kids what's going to be fun and interesting about your visit!*

Students will first be introduced to real scientific research of insect diversity, and exposed to real tools used in these investigations. Students will be given the opportunity to inquire about how science works and what some of the major goals are. During this time, students will be introduced to the vocabulary and concepts of this lesson (See below).

The primary focus of this lesson places students as primary investigators, examining insect collections to observe and document similarities and differences between related organisms. In this activity students will use “tools” of natural scientists to document the diversity of related organism populations. They will be given “Field Note Books”, magnifying glasses (scientific tools), and a unique insect collection from various geographic places (containing a map and a photo of the environment the organisms were collected in). Students will observe and draw conclusions about inheritance of appearance and characters, and how environment can cause natural variation.

## Goals:

- 1) Students will be introduced to the concept of “*scientists*” and *research* via real work done examining Hawaiian diversity in insects.
- 2) Students will be able to use a research tools (*magnifying-glass & Field notebooks*) to *examine and observe* differences in insect (living things)
- 3) Students will understand the elements that contribute to diversity in the world
  - a. Inheritance
  - b. Environment

## Focusing Questions:

- 1) What does the term \_\_\_\_\_ mean?
  - a. Appearance
  - b. Characteristics
  - c. Environment
  - d. Observe
  - e. \*Diversity
- 2) What are the similarities and differences in the groups (populations) of insects



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- a. Observation based question
- 3) Why are insects different in each group?
  - a. Especially since they are the same species
  - b. Answers should include environment and hint at genetic variation.

**Vocabulary/Definitions:** 3 – 6 important (new) words

**Expected:**

- Appearance: *The way something looks.*
- Characteristics: *A feature or a trait that a plant or animal has.*
- Environment: *Everything around an animal (or insect).*
- Observe: *The use of senses to find out about something.*

**Above and Beyond:**

- \* Diversity
- Inheritance
- DNA/Genetic:

**Materials:**

Intro:

**Research Tools:**

- Hand net
- Aspirator
- Collection Box
- Hat
- Field Notebook
- Writing Board (i.e. chalk, marker...)

Lesson:

- “Field Note Book”
- Pencils, crayons, markers, and/or colored pencils
- Magnifying Glasses
- Insect collections (5-10 specimens, map of geographic area, picture of environment)

**Classroom Set-up:**

Dependent on Classroom Structure and Class Size

- a) Classroom has desk area and sitting area. Students will be gathered in sitting area for introduction to day’s activities and myself. A semi-circle is important; students should be able to face each other for discussion-type dialogue.
- b) Insect collections will be divided up into geographic areas (arbitrarily or by actual collection) and placed as units and given to a group of 3-4 students (depending on class size).
  - a. Group sizes can be varied
  - b. Depending on classroom layout, boxes can be placed on tables or a desk. Special care should be made not to place it precariously so specimens are not destroyed.
- c) At the end, students will need to be brought back into focus either at their desks or stations or brought back to the sitting area.



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## Classroom Visit

### 1. Personal Introduction (What is a Scientist):

\_\_\_7\_\_\_ Minutes

- 1) Ask students ***what a scientist is?***
  - a. Ask lots of questions about the following topics to get students excited
- 2) Explain to them about research and ***my work*** on ***Hawaii***
  - a. Insects
  - b. Hawaii
  - c. Diversity = differences, a lot of it!!!!
  - d. *Research = idea, investigation, conclusions*
- 3) Introduce a lot of props
  - a. Field equipment: net, field note-book,
  - b. Maps
  - c. Photos of leafhoppers and Hawaii
- 4) Integrate topic of interest into my own research

### Topic Introduction:

\_\_\_13\_\_\_ Minutes

*Big Idea(s), vocabulary, assessing prior knowledge. What questions will you ask to learn from students?*

- 1) Take the vocabulary from above and write it on the board - *as I describe my own work.*
- 2) Brainstorm using a writing board different characteristics of insect
  - a. Write on Board
- 3) Through a constructivist process tease out accurate definitions from student generated responses.
- 4) If time permits, have them cite examples of each term.
- 5) Handout their own field note book and identification tool
  - a. Foreshadow the final focusing questions. Explain the layout of their field notebook

### 2. Learning Experience(s):

\_\_\_28\_\_\_ Minutes

*Demonstrations, hands-on activities, images, games, discussion, writing, measuring... What will you do, what will kids do? Describe in order, including instructions to kids.*

- 1) Organize students into groups (grouping will be done randomly: how usually?)
- 2) Bring groups to stations
- 3) Give each group one collection of insects to examine (these will be put into Schmitt boxes).
  - a. Groups can examine other insect collections later at the end of the class if time permits.
- 4) Model activity: Have one example
  - a. show students how to look at the insects and where to get location information and insect type.
- 5) Explain box set up
  - a. A single species
  - b. Designated "parents" and "offspring".
  - c. Label indicating geographic origin.
  - d. Picture of the habitat they exist in.



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→ all of which will be aimed at answering “why is there similarity and differences in groups of the same?”

- 6) Prompt students to think about the major questions: why do organisms look the same and different.
- 7) Allow students time to examine insect (this should take up the bulk of time allotted to this section).
  - a. They should be noting differences and similarities.
  - b. They should also be getting at an understanding of the why the diversity exists.
- 8) Bring students back together to refocus their attention on the teacher.

### 3. Wrap-up: Sharing Experiences and Building Connections \_\_\_\_\_ 10 \_\_\_\_\_ Minutes

*Putting the pieces together – how will students share learning, interpret experience, build vocabulary?*

- 1) Allow a few students explain what they saw in their collection
- 2) Have students answer the focusing questions in terms of the learned vocabulary
- 3) Tie this into the world around them and also reflect on my own work
- 4) Be flexible enough to allow students to drive discussion – in order to flesh out their understandings or misconceptions

### 4. Close: \_\_\_\_\_ 3 \_\_\_\_\_ Minutes

*How can kids learn more? Thanks and good-bye! Clean-up.*

- 1) Students can keep the materials (not insects, unfortunately, but they can collect their own).
- 2) “Students can go out, collect, and examine insects, plants, and animals around them. They are everywhere”.
- 3) Encourage students to remain in contact and to send the teacher or presenter information about what they find, which will need to be followed up with to maintain student interest.
- 4) Disperse any online or book information (need to compile a list).

**TOTAL** 50 – 60 **Minutes**

### Follow-up – After Presentation

- Suggest students write a letter explaining “How we learned about \_\_\_\_\_?”
- Students can use their “tools” and observation skills to observe the world around them and report back to the class or to me (leave contact info).
  
- Invent an Insect (California Academy of Sciences)  
<http://www.calacademy.org/teachers/resources/lessons/invent-an-insect/>
- Shake A Shrub – Find out what insects live in your own backyard.  
[http://www.aza.org/uploadedfiles/education/resources\\_for\\_educators/thematic\\_educational\\_activities/oef\\_shakeshrub\[1\].pdf](http://www.aza.org/uploadedfiles/education/resources_for_educators/thematic_educational_activities/oef_shakeshrub[1].pdf)



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